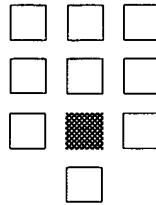


Netergy Advanced Telephony System

Netergy iPBX Server System



Introducing the Netergy™ iPBX Server System from 8x8, the first full-function private branch exchange (PBX) system designed specifically to allow service providers to deliver hosted iPBX services. Completely packet network based, the Netergy iPBX allows service providers to support up to 100 discrete iPBXs - each dedicated to an individual customer - and up to 10,000 total extensions. The Netergy iPBX Server System is part of the Netergy Advanced Telephony System (ATS), which includes cost-effective terminal adapters for customers and the most advanced user control software in the world.

System Architecture

The iPBX Server System consists of a cluster of carrier-grade Sun Microsystems Netra t1 Servers running the Netergy iPBX Server Software. The iPBX Server System is located in the service provider's data center, and it is connected to the customer's premise using any broadband IP connection, usually xDSL or T1, which can also be used to offer Internet connectivity. For telephone sets, customers can use inexpensive Netergy Media Hubs to adapt standard analog telephones to IP service or they can use next-generation IP phones. The Netergy ATS connects to the PSTN and the long-distance IP backbone through a SIP softswitch combined with an MGCP gateway or an H.323 gateway and gatekeeper.

Functionality

The Netergy iPBX Server Software provides complete PBX functionality: call hold, call transfer, three-way conferencing, multi-line phone support, paging, hunt groups, voicemail (optional, includes interactive voice response menuing and automated call distribution), direct inbound dialing, and more. Each Netergy iPBX Server can be custom configured for each customer and complete support for the Java Telephony Application Programming Interface (JTAI 1.3) allows customers to deploy CTI applications from third-party vendors.

Administration

Service providers control and configure the iPBX Server Software via a Web interface, allowing the system administrator to manage the iPBX from any location using any workstation with a browser. The administrator interface provides control of phone number block assignment, dial plans, service provisioning, DID assignments, iPBX status, bandwidth management and network topology. The iPBX supports external billing, voicemail, interactive voice response, automatic call distribution, auto attendants, directory service, unified messaging modules and OSS (operation, service and support) integration.

iPBX Architecture

The Netergy iPBX Server Software was designed specifically to allow service providers to offer iPBX hosting services. Because the Server Software was written entirely in Java, each instance of the software runs in its own Java virtual machine or sandbox. The insulation this architecture places between each instance provides a number of advantages. First, the use of separate virtual machines prevents any iPBX instance from affecting any other, providing a high degree of security. Second, the fact that each iPBX instance is separate allows each to be dedicated to individual customers, which allows for a high degree of customization.

The use of the separate instance architecture makes the iPBX solution easy to test and very scalable. The iPBX can be tested exhaustively because of its modular design. To scale the system, service providers need only add additional instances, which can be linked together to support larger customers.

Device Support

- SIP and H.323 gateways
- H.323 gatekeepers
- SIP softswitches
- Netergy Media Hub (MGCP)
- SIP terminals

Call Control Features

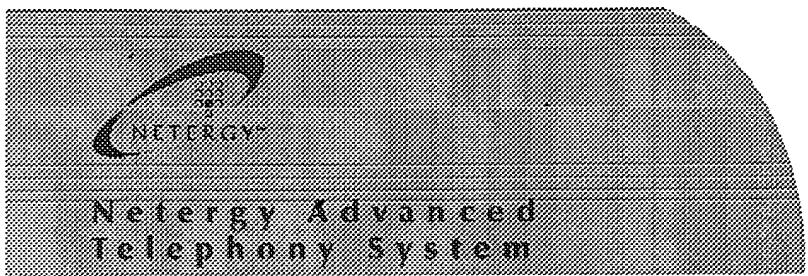
- Alternate call
- Conference call (multiple participants)
- Conference call (with resource dependent)
- Call forwarding
- Direct Inward Dial (unconditional, conditional)
- Call transfer (inbound, blind, announced)
- Call waiting
- Call associated data
- Call back
- Call hold/receive
- Call park
- Call pickup
- Camp-on call
- Consolidated call
- Directed routing call
- Line status monitoring
- Reconnect
- Call recording

Phone Management Features

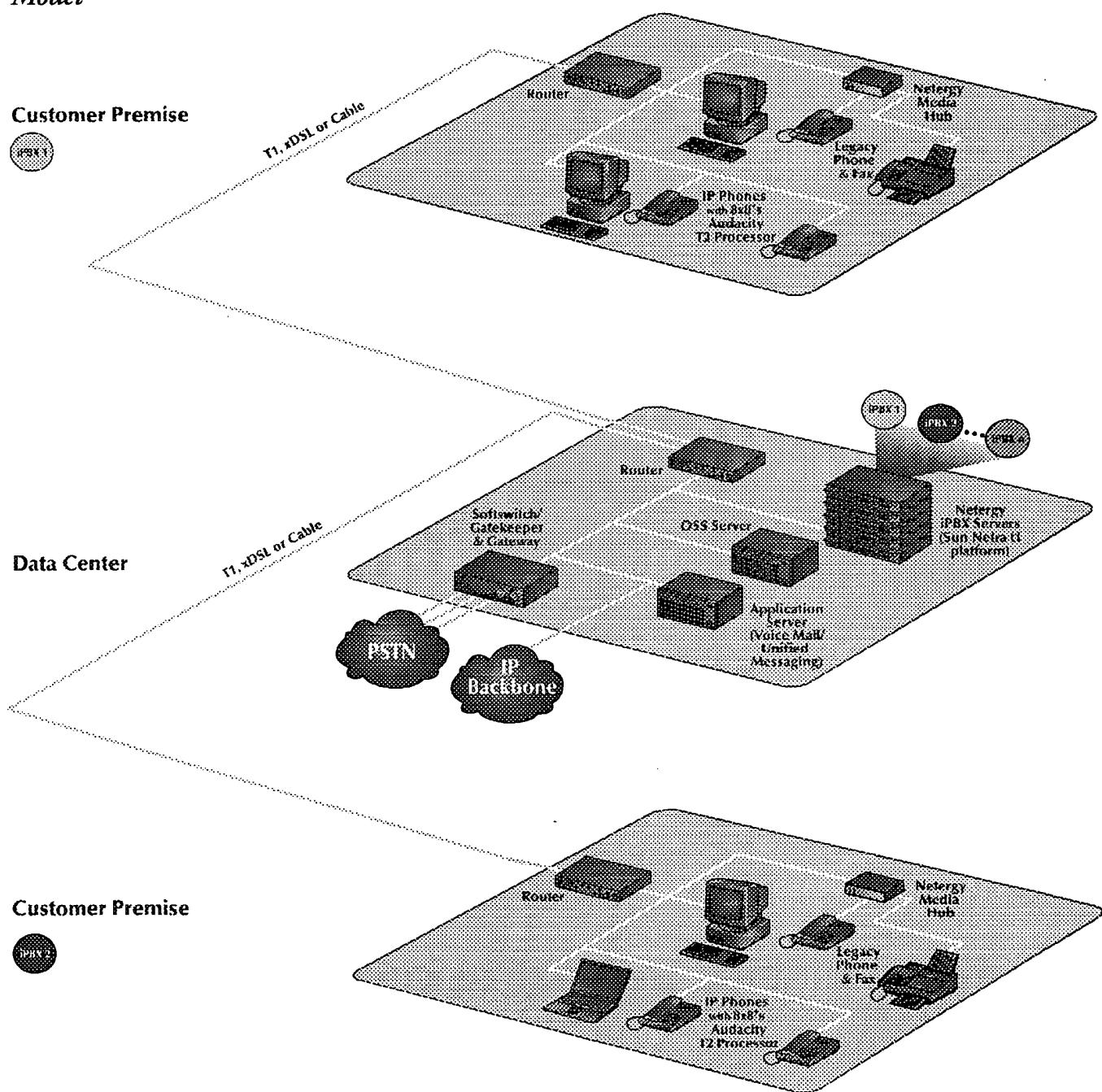
- Auto answering/voicemail
- Call reminder
- Call field presentation
- Interactive voice response
- On net device
- IVR support
- Toll-free
- Keypad commands
- Message waiting indicator (lamp, sound level)
- Photo station (multi appearance)
- Speed dial (programmable per user)

System Management Features

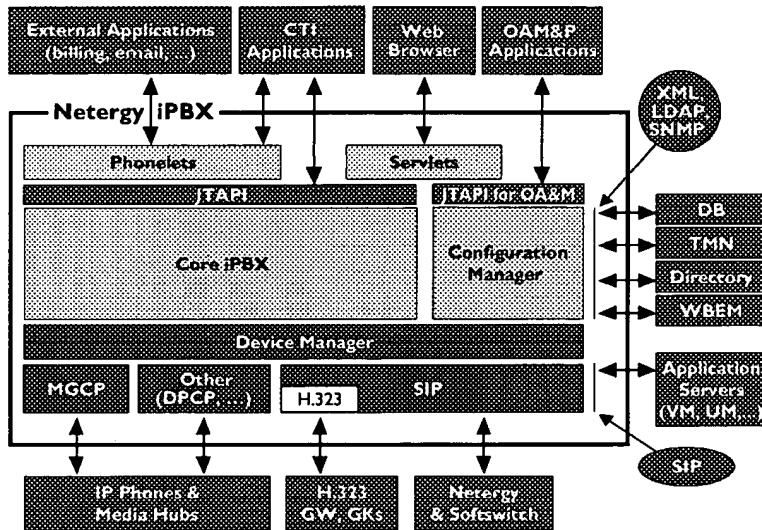
- Alarm generation (SNMP)
- Automatic media file download
- Bandwidth management (MGCP)
- Call queue
- Call record (programmable)
- DHCP support
- Client port configuration
- DID block assignment
- Dynamic DNS
- Dynamic Resource Update (DRU)
- File upgrade
- Load balancing
- Multilevel provisioning
- Redundancy



Hosted
iPBX
Model



*Netergy
iPBX
Server
Software
Architecture*



High Availability

The use of the separate instance architecture has implications for availability and load balancing as well. In the Netergy iPBX Server System, the separate iPBX instances are controlled and monitored by the Netergy SupraManager software. If performance of an instance falls below standards, the SupraManager automatically moves that instance to another less highly loaded Netra in the cluster. If the Supra Manager detects a fault in an iPBX instance, it will either restart that instance or move it to a different server, ensuring very high availability. This same mechanism supports live upgrades and maintenance, allowing the new versions of the Server Software to be installed without interrupting service to customers.

Configuration

With the Netergy iPBX, customers control their own moves, adds and changes using a Java-based application called Netergy Administrator. Adding additional lines is easy: the customer simply connects an additional Netergy Media Hub to his IP network. The Netergy Auto Discovery mechanism automatically configures the Media Hub. The customer then uses Administrator to assign extension numbers, associate user names and create a voicemail account for each line. Administrator also allows the customer to define hunt groups, set user permissions, define phone button functions, set voicemail parameters (optional), and much more, all with point and click ease.

Complete Control and Flexibility

On an individual level, the Netergy iPBX was designed to be extraordinarily flexible. The key to this flexibility is two abstraction layers, one between the core iPBX and other telephone equipment, including softswitches, gateways and terminals, the other between the core iPBX and its user interfaces. The telephone equipment interface employs a series of device drivers, which can be easily added or modified to support new devices. For example, today's iPBX supports MGCP-compatible telephones and Media Hubs, SIP-compatible softswitches and H.323-compatible gateways/gatekeepers. Adding support for a new device is accomplished by writing a new device driver.

The iPBX can be easily extended and customized through JTAPI, the Java Telephony Applications Programming Interface. Using this interface, 8x8 has written "phonelets," small applications that give specific models of telephones certain functionality. For example, phonelets interpret key presses to implement Centrex like keypad controls, turn on message waiting lights, support Caller ID and so on. Service providers can change phonelets to support specific models of phones or keypad command sets, giving customers exactly what they want.

In a similar fashion, servlets are mini Web servers that allow users to control the iPBX via Web browsers. Third-party applications can use the JTAPI interface to directly control the iPBX, making it possible to easily integrate enterprise data processing applications with an individual iPBX.

Customer Configuration Features

- Call recording
- Call statistics
- DID assignment
- Feature call screening (party, silent)
- Hunt group definition
- Media hub configuration
- Message waiting control
- Selectable maximum active connection per line
- User profile management
- (configuration profile, class of service)
- Voicemail parameters (optimization)

CII Interface

- ISDN PRI
- T1/E1

Application Module Support

- Auto attendant
- Automatic call distribution (ACD)
- Billing system:
 • CDR generation or direct CDR feed
- Incoming services (e.g. phone)
- IVR (interactive voice response)
- Multi-line control (MLC) (MLC conferencing)
- Music on hold (voice mail required)
- Mobility (voicemail)
- Unified messaging

Netergy IPBX Server System Platform

Processor

- Architecture:
 - Symmetric multi-chip modules
 - Von Neumann architecture
 - Single processor
- Cache:
 - 16 KB data and 16 KB instruction on chip
 - Independent of off-chip
 - 4 MB Memory L2 Cache

Standard Interfaces

- Network:
 - 10BaseT (ethernet) and 100Base-TJ (Serial)
 - Four RS-232C/RS-422/485 Serial Port
 - 40 Mbit/sec. Fibreoptic (OC-3c) B Syncronous

Mass Storage

- Storage:
 - 4 GB ATA Shingled CD, 24x speed
- Internal disk:
 - 4 GB, hot-swappable

Operating Environment

- Altitude:
 - 1000 m to 3000 m
- Temperature:
 - 5°C to 40°C (41°F to 104°F) 20% to 80%
 - relative humidity 10% condensing to 90% to 95% non-condensing humidity of 40-92% (no water or dew)
- Humidity:
 - 20% to 80% RH (23°C to 31°C)
- Acoustic noise:
 - 40 dB max (40 dB A)
- FCC ID: 4A9A-XA9
- IC: 2094A-XA9

- Source:
 - CIS-03-Core requirements for earth station
 - FCC ID: 4A9A-XA9 (25-315-2-1-43)
 - IC: 2094A-XA9 (25-315-2-1-43)

Regulations

- Safety:
 - UL 1449/CSA C22.2 No. 434
 - EN 60950/IEC 60950, IEC 60335
- EMI:
 - CISPR Title 27 FCC Part 15
 - EN 55022/IEC 655022
- Immunity:
 - CISPR Title 27 FCC Part 15
- Tele-Environment:
 - Telecom: CE Mark, FCC authorized
 - IC: 2094A-XA9
- Netgear Compliance:
 - Telecom: SR-1500 NEBB Level 3
 - Safety: UL Status Mark, CSA Status Mark
 - CE Mark
 - EMC: CE Mark, FCC authorized
 - IC: 2094A-XA9

Dimensions and Weight

- Overall:
 - user port, optical, configuration - five units
 - Height: 44.0 mm (1.73 in.)
 - Width: 427.2 mm (17.13 in.)
 - Depth: 397.4 mm (15.63 in.)
 - Weight: ~9 kg (20 lbs)
- Enclosure:
 - Backplane: Fibrebus 10/100/1000BaseT
 - PCB brackets: unleads mounting kit for 1000BaseT

User Interfaces

The Netergy IPBX Server Software supports two end-user interfaces for accessing system features and setting user preferences: a standard set of telephone keypad commands and the Netergy Communications Center software, which runs on the end user's PC. A Web-based application, Communications Center uses the graphical power of today's personal computers to let users configure and control their phones with point and click simplicity.

Communications Center provides Caller ID, deflection to voicemail, call transfers, conference call setup, on-screen directories and contact management, and call logging. It also lets users setup and control their voicemail, set forwarding numbers and filters, and setup personal speed dial simply and easily. Because it is Web-based, users can access the Communications Center from anywhere: in the office, at home or on the road.

The Netergy IPBX Server Software also supports the Switchboard software for attendants and receptionists. Switchboard runs on a standard PC and provides Caller ID, double-click transfers, graphical call status indications, general voice mailbox management and an onscreen corporate phone directory, all in an intuitive interface.

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